

THE ASHMOLEAN NATURAL HISTORY
SOCIETY OF OXFORDSHIRE.

A *Historical Account of the Ashmolean Natural History Society of Oxfordshire, 1880-1905.* By Frank Arthur Bellamy. Pp. xvi+544. (Oxford: Published by the Author, 4 St. John's Road, 1908.) Price 10s. net.

THE volume before us should have an interest, not only for members of the society in question, but for all naturalists, who should be glad to possess a record of the doings of one of the largest, most active, and—in virtue of its amalgamation with the Ashmolean Society, founded in 1828—one of the oldest scientific societies in England. It is seldom that such an organisation finds so good a biographer; the precision of the astronomer can be traced in the author's attention to the minutest details of history, and the care taken to ensure accuracy with regard to every point mentioned. Owing to the arrangement adopted, it has evidently been impossible to avoid the slight overlapping of subject-matter, but there can be few if any questions relating to the society's existence and work which are not dealt with in this very comprehensive record.

It is probably true of almost all societies that they owe much to their officers, but especially has this been true of the Ashmolean Natural History Society of Oxfordshire in all stages of its chequered existence. Of the earliest officers of the "old Ashmolean" little is known, owing to the disappearance of the original minute-books; the "Proceedings" of that society were not published until some years after its origin, though we learn (p. xv) from the Radcliffe Observer in 1866 that

"At the time of its institution it was second to scarcely any similar society in Europe, either in the roll of its illustrious members or in the value of its contributions to science."

So late as 1880, however, it had not opened its doors to any but members of the university, and this fact gave origin to the Oxfordshire Natural History Society and Field Club, founded by the even then well-known botanist Mr. George Claridge Druce, with the cooperation of many distinguished men of science.

No circumstance is more happy in the history of the two societies than that when the "old Ashmolean" decided to unite the property and traditions of a glorious past and—shall we say?—a somewhat decadent present to the active existence and brilliant future of the society which now holds a well-deserved position as the senior scientific society of Oxford. The tale of how this was accomplished is fully set forth in Mr. Bellamy's pages, as well as the part played by many of the society's officers in bringing about this union. Perhaps a large share of honour may be felt to be due from English naturalists generally to Dr. V. H. Velej, F.R.S., whose strenuous exertions as last librarian of the older society alone saved from an ignoble fate and made available for all time one of the largest and most valuable lending scientific libraries in England, which included complete sets of periodicals no longer obtainable at any price, as well as single volumes of great rarity.

NO. 2043, VOL. 79]

Mr. Bellamy's history shows that no "winter wind" of ingratitude ever blew over the Ashmolean Natural History Society, for are not all these things, as well as the labour of love of many presidents, treasurers, librarians, and secretaries, writ large in his chronicle? The only person whose unremitting if unobtrusive labours on behalf of the society receive a bare line of notice is the author himself (p. 121). But none who knows the inner history of the society will fail to give honour where honour is due. Such a record must necessarily contain many dry facts and statistics, which are of value mainly to those concerned, but there is ample evidence that such researches may be enlivened by flashes of humour, as in the account of the recovery of the ancient wood-block (p. 59) and of other quaint occurrences.

The book is excellently printed, and contains as frontispiece a portrait of the late Prof. J. O. Westwood.
L. J. V.

ELECTROCHEMICAL PRACTICE AND POWER
DEVELOPMENT.

- (1) *Cyanide Processes.* By E. B. Wilson. Fourth edition. Revised and enlarged. Pp. vii+249. (New York: John Wiley and Sons; London: Chapman and Hall, Ltd., 1908.) Price 6s. 6d. net.
- (2) *Electric Furnaces. The Production of Heat from Electrical Energy and the Construction of Electric Furnaces.* By Wilhelm Borchers. English Translation by H. G. Solomon. Pp. ix+224. (London: Longmans, Green and Co., 1908.) Price 7s. 6d. net.
- (3) *Hydro-electric Practice. A Practical Manual of the Development of Water Power, its Conversion to Electric Energy, and its Distant Transmission.* By H. A. E. C. von Schon. Pp. xv+382. (Philadelphia and London: J. B. Lippincott Company, 1908.) Price 25s. net.

(1) THIS book upon "Cyanide Processes for Gold Extraction" is evidently intended for those who know nothing about the extraction of gold by means of cyanide, and it is therefore written in a style to suit the tyro, and is also intended to help those who wish to take up the cyanide-extracting industry. It commences with a description of ores suitable for the cyanide process, and starts off with the definition that any material which it will pay to work is an ore. Ores are distinguished as free, milly, refractory, acid, and base-metal ores, and it is shown how these various ores behave towards cyanide solutions. We notice on p. 11 that tellurium is said to be soluble in the presence of sodium dioxide, but sodium dioxide is hardly a substance which one expects to find employed in the extraction of gold.

We regret to say that chapter ii. is very unsatisfactory. It deals with potassium cyanide and oxygen, and contains several equations, some of which are not correct; but chapter iii. is still worse, and this has to do with the chemistry of the operation. On p. 27 we notice that there are men working the cyanide process successfully who know little of its chemistry and no other chemistry at all. From this chapter they will not learn correct chemistry of the cyanide

processes, and they certainly will not learn other chemistry.

The author seems to be unaware of the elementary principle that both sides of an equation must balance; in one case, for example, where there is only one potassium on the left-hand side of the equation he has potassium carbonate upon the other side. He gets over the difficulty of lack of potassium by writing potassium carbonate KCO_3 . We may also point out that ferrous sulphate is not Fe_2SO_4 ; one would have thought that he might have found a more recent equation for the action of ferrous sulphate than that of Berzelius. The chapter on laboratory tests is better, but until we get to chapter v. ("The Plant for Cyaniding") the author is out of his depth. It is evident, however, that he does understand the practice of the cyanide process.

It is interesting to note how, as the subject of "leaching" has become better known, and the methods of treatment of the ore more carefully worked out, so the strength of the cyanide solution employed has gradually become weaker and weaker, and the extraction of gold, more through loss of cyanide during the operation, has become less. When the author comes to dealing with electrocyaniding, that is to say, the recovery of gold by electrical means, we wish he had asked someone else who understood the subject to write this part for him. He has collected many facts jumbled up in a manner which would spell absolute confusion to anyone not versed with electrochemical methods. For example, speaking of anodes, and referring to platinum, he first of all says that the decomposition which takes place of the electrolyte at the anode is energy expended, not on work, but in setting free oxygen which will probably decompose the electrolyte; and then he goes on to write about the amount of platinum which should be liberated in an ampere-hour, but we do not profess to know what he means. The extraordinary thing is that all these mistakes of nomenclature and misprints occur in a book which is in its fourth edition. The practical part of the book with reference to leaching of the ores and so on can be recommended as being useful; we prefer not to say anything about the rest of it.

(2) The second book is of an entirely different class, and is written in quite a different style. Any book by Prof. W. Borchers upon electric furnaces is sure to attract interest. We notice, however—but it is perhaps not to be wondered at—that the furnaces designed by Prof. Borchers himself loom rather large. He certainly has done much pioneering work, and has had some extremely good ideas, but it is to be feared that others gained by his suggestions more than he himself.

The book commences with an introduction in which the conversion of electrical energy into heat is discussed. Each chapter of the book deals with a different class of furnace, and in every case the subject is treated in a more or less historical manner. Chapter ii. is devoted to direct-resistance heating, and deals in the first place with the production of aluminium, and we notice on p. 23, in reference to the Héroult furnace, a mistake in which the word

"anode" twice occurs instead of "cathode." The chapter also has an account of the various induction furnaces, the description of which is all too short; this is such an important branch of electrometallurgy that it would have been well worth while to have given a much fuller and more descriptive account of it.

Chapter iii. deals with indirect resistance furnaces, in which the substance to be heated is in contact with another material, which is electrically heated; this may be a core running through the furnace, which, by means of its resistance, becomes highly heated. The substance which it is required to heat or reduce is placed round about it, and thus receives the heat from the core. Mention is also made of the kryptol furnace. Direct arc heating is the subject of the next chapter, and here the author deals with carbide furnaces, and refers to the acetylene arc furnace of Berthelot. The phosphorus arc furnace of Readman and Parker is also described. Indirect arc heating is the subject of the next chapter, such, for example, as is employed in zinc furnaces for the distillation of the metal.

The last two chapters are devoted respectively to the arrangement of furnaces for different modes of heating, and to the construction of electric furnaces in general. A short appendix by the translator is devoted to some recent developments in electric steel furnaces.

The book is decidedly useful, is very well illustrated, and carefully translated, but at times the description is scrappy, and we are rather afraid the reader who knows nothing about furnaces will hardly get sufficient information to be of service.

(3) The third book deals with hydro-electric practice, and is an extremely valuable contribution to the subject. The author has written it for two classes of readers. The first part is intended for those who have no engineering training or experience—that is to say, for the layman who may desire to know something about water-power schemes, and to whom it is necessary to have some idea as to whether it would be advisable to risk anything in the undertaking or not. The second part, entitled "Designing and Equipping the Plant," is written for the student, and the aim of the author has been to make the treatment of this part of the subject complete in all its phases, with the exception that he presupposes a knowledge of the principles of surveying and of the rudiments of hydraulics, hydrostatics, and dynamics. Occasionally in the first portion of the book, in order to make himself perfectly clear, the author gives definitions which are rather unnecessarily elementary; for example, is it necessary to say that all the water consumed by vegetation and vapourised is evaporation, and the portion which runs into the stream is the run-off?

The enormous amount of trouble which Mr. von Schon has taken in the compilation of his facts can be seen from the table of rivers, drainage areas, and low monthly flow, which extends from p. 10 to p. 26, and, of course, there are many other tables and diagrams interspersed throughout the volume.

Chapter ii. is entitled "Power Opportunity," meaning to say the possibilities of obtaining water from

any given source, and the author shows how the flow deductions can be estimated from the precipitations, that is, the amount of water obtained from rainfall, &c. He points out how, in one case, the failure to study this caused a syndicate to credit a certain source of output with 3500 h.p., where, as a matter of fact, the "opportunity" was good for about 1500 h.p., with 250 h.p. auxiliary plant to supplement the three months' low-flow output. It will be seen, therefore, that the reading of this book will help to prevent the investor from putting his money into "wild-cat schemes."

Part ii., as already mentioned, is for the practical man, and certainly contains too many formulæ for the uninitiated, although these are absolutely essential to the engineer. This portion of the book commences with a survey which embraces all operations by which the hydrographic, topographic, and geological characteristics are investigated.

Having obtained the data furnished by a careful survey, the next chapter deals with the development programme, and this part is remarkably well illustrated by means of line blocks, showing different methods of development; for instance, direct development in rocky gorge, short diversion development, distant development, and so on.

The space at our disposal will not allow us to go more fully into this extremely interesting work. The half-tone illustrations of various power houses and power schemes are exceedingly well got up, and are a valuable aid to the reader. It only remains to say that the author is to be congratulated upon having brought out a book which is useful to the general public, and also of great value to the specialist.

SOME NEW CHEMICAL BOOKS

- (1) *Technical Chemists' Handbook*. By Dr. G. Lunge. Pp. xv+260. (London: Gurney and Jackson, 1908.) Price 10s. 6d. net.
- (2) *Exercises in Elementary Quantitative Chemical Analysis for Students of Agriculture*. By Dr. A. T. Lincoln and Dr. J. H. Walton, jun. Pp. xv+218. (New York: The Macmillan Co.; London: Macmillan and Co., Ltd., 1908.) Price 6s. 6d. net.
- (3) *Laboratory Manual of Qualitative Analysis*. By W. Segerblom. Pp. xii+136. (London: Longmans, Green and Co., 1908.) Price 3s. 6d.
- (4) *Synthetic Inorganic Chemistry*. By Dr. A. A. Blanchard. Pp. viii+89. (New York: J. Wiley and Sons; London: Chapman and Hall, Ltd., 1908.) Price 4s. 6d. net.
- (5) *The Fundamental Conceptions of Chemistry*. By Dr. S. M. Jørgensen. Translated by M. P. Appleby. Pp. viii+175. (London: Society for the Promotion of Christian Knowledge, 1908.) Price 2s. 6d.
- (6) *Kurzes Repetitorium der Chemie*. I., Anorganische Chemie. By Dr. E. Bryk. Breitenstein's Repetitorien, No 7. Pp. iv+244. (Leipzig: J. A. Barth, 1908.) Price 2.85 marks.

(1) DR. Lunge's "Technical Chemists' Handbook" is a new and revised edition of the extremely useful little volume, well known under the title of "The Alkali Makers' Pocket-book," and later as NO. 2043, VOL. 79]

"The Alkali Makers' Handbook." In many respects the new volume, in the preparation of which the author has had the assistance of Dr. Berl, is unlike its predecessors, which were intended mainly for the laboratory of the alkali maker. The scope is greatly enlarged, and covers a variety of industries. The old material is brought up to date, and there are new chapters on water for boilers, on coal gas and its products, on calcium carbide and acetylene, on fertilisers, aluminium salts, and calcareous cements. The book, although intended for the works, will also be found useful in a college laboratory in training the future professional chemist. It possesses, it may be added, a great advantage over many technical handbooks, for it embodies the results of long personal experience, and, being restricted in its scope, can afford space to enter into the minutiae of each operation.

(2) The volume by Drs. Lincoln and Walton is intended for agricultural students. The first half is an introduction to the methods of ordinary quantitative analysis, and is written with great care and thoroughness. It might include with advantage a few more gravimetric exercises. The second part is technical, and is devoted to the analysis of milk, butter, food-stuffs, fertilisers, and soils, and concludes with analytical problems and methods of calculation under the title "stoichiometry." There is little which calls for criticism, for the volume is evidently written by experts who are thoroughly *au fait* with their subject. We would only direct attention to the fact that the standards given are mainly those of the U.S. Department of Agriculture, which are not in force in this country. The same may be said of some of the apparatus and methods. The Babcock method is, we believe, not used here, and the Hanus method is a modification of what is generally known as Hübl's method. It might be well to include in a subsequent reprint a figure of the Reichert-Meissl apparatus, and details of dimensions which are essential. The method of estimating potassium in soils is not given in sufficient detail for those special cases where modifications may be necessary.

(3) It is difficult to realise the particular aspect of qualitative analysis which compels teachers to add to the already extensive literature on the subject. It is rarely that one finds a new arrangement, new tests, new apparatus, or new reactions. The order of the groups, the disposition of principal and subgroups, and the general and special reagents, are always the same. We have examined Mr. Segerblom's volume in vain for something new or suggestive. We are inclined to question the utility of general definitions at the beginning of a book, and certainly some of those given are not very happy. "A reaction," we are told, "is any phenomenon exhibited by a substance." According to this, the breaking of glass would be a reaction. Although there is nothing that strikes one as new, it may be said that the description of the different operations is full and clear; the book is excellently printed, and there is a useful appendix of "study questions" to beguile the student's leisure.

(4) The little volume entitled "Synthetic Inorganic Chemistry" contains a description of a series of simple preparations of metallic compounds, and is